

RELATED APPLICATIONS

This is a continuation-in-part of U.S. Application No. 10/120,603, filed April 9, 2002, now U.S. Patent No. ^{6,885,341}4, which claims the benefit of U.S. Provisional Application No. 60/283,093, filed Apr. 11, 2001, the disclosures of which are hereby incorporated by reference.

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BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

This invention generally relates to wireless communication antennas and, more particularly, to an invented-F antenna that is tuned using a ferroelectric capacitor.

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2. DESCRIPTION OF THE RELATED ART

There are several types of conventional antenna designs that incorporate the use of a dielectric material. Generally speaking, a portion of the field that is generated by the antenna returns to the counterpoise (ground), from the radiator, through the dielectric. The antenna is tuned to be resonant at frequencies, and the wavelengths of the radiator and dielectrics have an optimal relationship at the resonant frequency. The most common dielectric is air, with a dielectric constant of 1. The dielectric constants of other materials are defined with respect to air.

Ferroelectric materials have a dielectric constant that changes in response to an applied voltage. Because of their variable dielectric constant, ferroelectric materials are good candidates for making tunable components. Under presently used measurement and characterization techniques, however, tunable ferroelectric components have gained the reputation of being consistently and substantially lossy, regardless of the processing, doping or other fabrication techniques used to improve their loss properties. They have therefore not been widely used.